

APPENDIX C – BLM Fuels Treatment Recommendations

1.1 Forestland

Considerations include topographic location, slope steepness, predominant wind direction, and the amount and arrangement of surface, ladder, and crown fuels when developing fuels treatment prescriptions. Prescriptions for forested compartments within the project area incorporate the following components: legal access, travel management (skid roads and trails excluded), silvicultural system, landing locations, species composition, basal area (merchantable timber species >7.9 inches diameter at breast height (DBH)), total average tree height and diameter (all species), average tree age (by species), marking guides, yarding system, slash disposal, cutting cycle (entry schedule), and additional information (see Appendix A – Glossary).

1.1.1 Ground-Based Yarding

Compartment A – This 242.6 acre compartment contains stands with an average basal area (BA) of 140 square foot/acre (sq. ft./ac). Few if any insect or disease problems were seen in this compartment.

Travel management – Access from the north through Capron property. Existing road will need to be improved for approximately 1/3 mile where road will fork to the east Road A1 (R-A1) and to the southwest Road A2 (R-A2). Both R-A1 and R-A2 will be newly developed roads.

Silvicultural system – Individual tree selection.

Landings – (L-A1 and L-A2) will be established at the ends of R-A1 and R-A2.

Species composition – 35% Douglas-fir; 35% Lodgepole Pine; 25% Sub-alpine fir; 5% Engelmann Spruce.

Average tree height – 78 feet (ft.); Average tree diameter: 16 inches (in.).

Average age – Douglas-fir 198 years; Engelmann spruce 150 years; Lodgepole pine 94 years.

Marking guides – leave tree mark. Select Douglas-fir and Engelmann spruce as leave trees when health and form class allows. Avoid retention of sub-alpine fir and encourage the removal of this species if possible. Lodgepole pine is reaching the end of its rotation age and should be selected for harvest when possible.

Slash disposal will involve limbing and bucking at the landing and piling slash including tops and limbs in openings (See Appendix B for Standards and Specifications).

Cutting cycle – harvest timber to 100 square feet basal area per acre. Commercial thin from below leaving dominant, healthy trees making up the residuals (After initial entry, monitor residual stands for windthrow and insect and disease problems. Modify cutting cycle to allow for salvage and sanitation cuts if necessary). A second entry is recommended in ten years that

would leave a residual stand of 80 square feet basal area per acre. In the event successful regeneration is occurring, a third and final entry will occur in 15 years leaving a residual stand of no less than 40 square feet basal area per acre of dominant, healthy trees.

Additional information - Care should be taken to protect regeneration during harvest activities.

Compartment B – This 107.1 acre compartment contains stands with an average BA of 150 sq. ft./ac. Few insect or disease problems were seen in this compartment except for some western balsam fir beetle in the sub-alpine fir.

Travel management plan - access from the northeast through Capron property. A creek crossing will need to be made below Capron's home at the fork with Road-A upstream from his well location. The road (R-B) will then proceed southwest following the existing ATV trail, and will need to be improved.

Silvicultural system – Individual tree selection.

Landings – (L-B1 and L-B2) will be established along R-B1 and R-B respectively.

Species composition – 25% Douglas-fir; 17% lodgepole Pine; 58%; sub-alpine fir.

Average tree height – 71 feet (ft.); Average tree diameter: 14 inches (in.).

Average age – Douglas-fir 159 years; Engelmann spruce 96 years; lodgepole pine 92 years.

Marking guides – leave tree mark.

Slash disposal will involve limbing and bucking at the landing and piling slash including tops and limbs in openings. (See Appendix B for Standards and Specifications.)

Cutting cycle – Harvest timber to 110 square feet basal area per acre. Commercial thin from below leaving dominant, healthy trees making up the residuals (After initial entry, monitor residual stands for windthrow and insect and disease problems. Modify cutting cycle to allow for salvage and sanitation cuts if necessary). After initial harvest a second entry is recommended in ten years leaving a residual stand of 80 square feet basal area per acre. In the event successful regeneration is occurring, a third and final entry will occur in 15 years leaving a residual stand of no less than 40 square feet basal area per acre of dominant, healthy trees.

Additional information - after initial entry, monitor residual stands for windthrow and insect and disease problems. Modify cutting cycle to allow for salvage and sanitation cuts if necessary. Care should be taken to protect regeneration during harvest activities.

Compartment C – This 104.7 acre compartment contains stands with an average BA of 120 sq. ft./ac.

Insects and diseases – Douglas-fir beetle was found in 20% of the Douglas-fir in this compartment; western balsam fir beetle was found in 50% of sub-alpine fir.

Travel management – R-B will proceed northwest on a contour to the draw bottom in the northeast corner of section 7 (all descriptions for BLM administered lands are in Township 36 North, Range 112 West). R-B then follows an existing ATV trail up the draw and across to the high area in the middle of section 7. A spur road (R-C1) branches to the north and out to the far north of the compartment.

Silvicultural system – Individual tree selection. Group selection will be used where sanitation and salvage harvests are required to remove insect infested trees.

Landings – L-C1 will be located in the middle of the compartment and L-C2 at the end of R-C1.

Species composition – 60% Douglas-fir; 35% sub-alpine fir; 5% Engelmann Spruce.

Average tree height – 74 ft.; Average tree diameter: 13 in..

Average age – Douglas-fir 142 years; Engelmann spruce 130 years; sub-alpine fir 130 years.

Marking guides – leave tree mark. Select Douglas-fir and Engelmann spruce as leave trees when health and form class allows. Avoid retention of sub-alpine fir.

Slash disposal - will involve limbing and bucking at the landing and piling slash including tops and limbs in openings. (See Appendix B for Standards and Specifications.)

Cutting cycle – harvest timber to 80 square feet basal area per acre. Commercial thin from below leaving dominant, healthy trees making up the residuals (After initial entry, monitor residual stands for windthrow and insect and disease problems. Modify cutting cycle to allow for salvage and sanitation cuts if necessary). A second entry is recommended in ten years that would leave a residual stand of 60 square feet basal area per acre. In the event successful regeneration is occurring, a third and final entry will occur in 15 years leaving a residual stand of no less than 40 square feet basal area per acre of dominant, healthy trees.

Salvage and sanitation cuts will take place where Douglas-fir beetle and western balsam fir beetle infestations are occurring.

Additional information - Care should be taken to protect regeneration during harvest activities.

Compartment D – This 316 acre compartment contains stands with an average BA of 40 sq. ft./ac. There is a high composition of lodgepole pine with an average age of 67 years. Low severity dwarf mistletoe occurs and where present should be removed. No harvest is recommended within this compartment at present. Individual removal of dwarf mistletoe trees is recommended if this can occur without new road construction (see slash disposal remarks below). Re-evaluate in 20-25 years.

Pre-commercial thin lodgepole to reduce spacing of less-than-four inches DBH trees to approximately 300 trees-per-acre (TPA). Thin trees in the five to eight inch diameter class to 80-120 TPA.

Insects and diseases – Spruce budworm with low severity was seen in a small percentage of trees. Dwarf mistletoe at a moderate severity was seen in a small percentage of trees.

Travel management – No travel plan is recommended at this time.

Silvicultural system – none recommended.

Landings – None recommended at this time.

Species composition – 90% lodgepole pine; 5% Douglas-fir; 5% limber pine.

Average tree height – 52 ft.; Average tree diameter: 11 in.

Average age – Lodgepole pine 67 years.

Marking guides – Cut-tree mark spruce budworm and dwarf mistletoe infested trees. GPS coordinates should be recorded for later location.

Slash disposal – Spruce budworm and dwarf mistletoe infested trees will be cut on site, bucked into sizes easily handled, and piled in openings. Piles should be disposed of by mechanical treatment or burning at the earliest opportunity.

Cutting cycle – Remove spruce budworm infested trees as soon as possible.

Compartment Q – This 115.5 acre compartment contains stands with an average BA of 100 sq. ft./ac. Lodgepole pine in this stand is reaching the end of its rotation age and could sustain a “light” harvest to improve forest health and reduce horizontal fuel continuity.

Travel management - Access from the east on R-D. Road R-Q (R-Q) will branch due south at ridge crest in the north half of the southwest corner of section 10. Road R-Q1 (R-Q1) branches west and follows a contour to L-Q1. Road Q-2 (R-Q2) branches southeast and follows a contour to L-Q2. All would be newly constructed roads.

Insect and diseases – Few if any insect or disease problems were seen in this compartment.

Silvicultural system – Individual tree selection.

Landings (L-Q1 and L-Q2) will be established at the ends of R-Q1 and R-Q2 respectively.

Species composition –90% lodgepole pine; 10% aspen.

Average tree height – 62 ft.; Average tree diameter: 12 in.

Average age – Lodgepole pine 89 years.

Marking guides – cut-tree mark.

Slash disposal – will involve limbing and bucking at the landing and piling slash including tops and limbs in openings. (See Appendix B for Standards and Specifications.)

Cutting cycle – Harvest to 80 square feet basal area per acre during the initial entry. This would serve to reduce risk of crown fire and improve forest health. A second entry is recommended in ten to 15 years that would leave a residual stand of 60 square feet basal area per acre. In the event successful regeneration is occurring, a third and final entry will occur ten to 15 years later with an overstory removal. Select dominant, well-formed trees as residuals. Harvest all trees containing dwarf mistletoe. Create shaded fuel breaks along roads.

Compartment R – This is a 71.3 acre compartment. Past harvesting and pre-commercial thinning has occurred in the north portion of this compartment. Stands have an average BA of 20-40 sq. ft./ac.* Few if any insect or disease problems were seen in this compartment. Lodgepole pine on the north-facing slope in this compartment is reaching the end of its rotation age. Declining and poorly formed trees should be harvested in order to open up stand to regeneration.

Travel management - Access from the south on Road R (R-R). Road-R1 (R-R1) branches northwest and follows a ridge to L-R1. Road R-2 (R-R2) branches northwest approximately 1/4-mile farther north on R-R and follows a shallow draw to the top of East Rim. A private cabin site is 100 yards to the northeast. Timber will be landed to L-R2 at mid-slope along R-R2.

Insect and diseases - Few if any insect or disease problems were seen in this compartment.

Silvicultural system – Individual tree selection.

Landings – (L-R1 and L-R2) will be established at the ends of R-R1 and along R-R2 to the west respectively.

Species composition – 100% lodgepole pine.

Average tree height – 50 ft.; Average tree diameter: 15 in.

Average age – Lodgepole pine 75 years.

Marking guides – cut-tree mark.

Slash disposal – will involve limbing and bucking at the landing and piling slash including tops and limbs in openings (See Appendix B for Standards and Specifications).

Cutting cycle – A single entry with an improvement cut. This entry will remove all disease and insect infested trees as well as all trees with poor form or in a state of decline. This will serve to reduce risk of crown fire and improve forest health. Additional entries not anticipated. Re-evaluate in 20 to 25 years.

*Based on one sample point.

Compartment S – This is a 57.9 acre compartment. Stands have an average BA of 80 sq. ft./ac. A significant percentage (50%) of the lodgepole pine in the compartment is infested with dwarf mistletoe. Infested trees as well as declining and poorly formed trees should be harvested in a sanitation cut. Lodgepole pine in this compartment is reaching the end of its rotation age.

Thirty percent of species composition is Douglas-fir. Select Douglas-fir as the leave trees making up the residual stand.

Travel management - Access from the south on Road R (R-R). Skid timber to the main road (R-R).

Insect and diseases – dwarf mistletoe with moderate to high severity is present in 50% of the lodgepole pine sampled.

Silvicultural system – Individual tree and group selection.

Landings – landings will be located at the south and north ends of R-R on the east side of the road.

Species composition – 35% lodgepole pine; 35% sub-alpine fir; 30% Douglas-fir.

Average tree height – 45 ft.; Average tree diameter: 12 in.

Average age – Lodgepole pine 100 years.

Marking guides – leave-tree mark.

Slash disposal – will involve limbing and bucking at the landing and piling slash including tops and limbs in openings. (See Appendix B for Standards and Specifications.)

Cutting cycle – A single entry with an improvement cut. This entry will remove all disease and insect infested trees as well as all trees with poor form or in a state of decline. This will serve to reduce risk of crown fire and improve forest health. Additional entries not anticipated. Re-evaluate in 20 to 25 years.

1.1.2 Helicopter Yarding/Inoperable

Compartments -E, P, V, W, and X – These compartments consist of the following acreages respectively: 169.7, 86.6, 39.7, 46.2, and 30.3. These compartments contains stands with an average BA of 60 to 200 (Compartment E has a BA of 140 sq. ft./ac.). Due to the steep slopes,

ground based yarding systems are not practical in these compartments. (High lead or short span skyline yarding are possibilities though the adverse visual impact is a concern.)

In the event helicopter or highlead yarding systems are not feasible options these compartments may be considered inoperable. Where these compartments border prescribed fuel breaks, hand-cut fuels modifications in the form of thinning, limbing, and clearing of down and dead woody material should occur.

Travel management – not applicable.

Insect and disease – Douglas-fir beetle with moderate severity present in some areas. Spruce budworm was also detected in this compartment.

Silvicultural system – Individual tree selection.

Landings – helicopter yarded timber could be landed at L-A1, L-A2, L-A3, and L-B2.

Species composition – 20% Douglas-fir; 50% Engelmann spruce; 30% sub-alpine fir.

Average tree height – 88 ft.; Average tree diameter: 17 in..

Average age – Douglas-fir 200 years; Engelmann spruce 150 years.

Marking guides – leave tree mark. Select Douglas-fir and Engelmann spruce as leave trees when health and form class allows. Avoid retention of sub-alpine fir.

Slash disposal – will involve lopping and scattering slash at the site of felling. Whole trees (minus limbs) will then be yarded to landing(s) where tops will be cut and piled. (See Appendix B for Standards and Specifications.)

Cutting cycle – harvest timber to 60-100 square feet basal area per acre (depending on initial BA and not removing more than ½ of the total timber volume). Commercial thin from below leaving dominant, healthy trees making up the residuals (after initial entry, monitor residual stands for windthrow and insect and disease problems. Modify cutting cycle to allow for sanitation cuts if necessary). A second entry is recommended in ten years that would leave a residual stand of 40-80 square feet basal area per acre. In the event successful regeneration is occurring, a third and final entry could take place in 15 years leaving a residual stand of no less than 20 square feet basal area per acre of dominant, healthy trees.

Additional information – helicopter yarding may be impractical due to the high cost. The timber quality and high value may make the use of this yarding system practical.

1.1.3 Short span skyline yarding

Compartment F – This 190.6 acre compartment contains stands with an average BA of 10 sq. ft./ac. Due to the steep slopes, ground based systems are not practical in this compartment. High lead or skyline yarding would be economical and practical in this area. The difficulty may be

locating an operator in the area with the equipment. Helicopter yarding would be another option for the removal of timber in this compartment.

Travel management – Access will be from the east on Road D, which travels in an east/west direction for one mile at the top of South Rim. A skyline system could be set up along this distance.

Insect and disease – Western balsam fir beetle is present and increasing causing moderate to severe damage to the sub-alpine fir.

Silvicultural system – short span skyline.

Landings – timber could be landed in several locations along R-D.

Species composition – 25% Douglas-fir; 20% Engelmann spruce; 50% sub-alpine fir; 5% lodgepole pine.

Average tree height – 81 ft.; Average tree diameter: 13 in.

Average age – Douglas-fir 200 years; Engelmann spruce 125 years; sub-alpine fir 105 years; lodgepole pine 150 years.

Marking guides – leave tree mark. Select Douglas-fir and Engelmann spruce as leave trees when health and form class allows. Avoid retention of sub-alpine fir.

Slash disposal – will involve lopping and scattering slash at the site of felling. Whole trees (minus limbs) will then be yarded to landing(s) where tops will be cut and piled along R-D. Piled tops can be later utilized for firewood. (See Appendix B for Standards and Specifications.)

Cutting cycle – harvest timber to 60-80 square feet basal area per acre (depending on susceptibility of windthrow). Commercial thin from below leaving dominant, healthy trees making up the residuals. (After initial entry, monitor residual stands for windthrow and insect and disease problems. Modify cutting cycle to allow for sanitation cuts if necessary.) A second entry is recommended in ten to 15 years that would leave a residual stand of 40-60 square feet basal area per acre.

Additional information – **Compartment G** will follow the same prescription as Compartment F. Access for Compartment G will be via R-R to R-R1. No tree data is available for Compartment G. Compartment G is 9.4 acres.

1.1.4 Hand-cut fuel break

Compartments H, I, J, K, L, M, N, O, and Y – These compartments are comprised of the following acreages respectively: 17.2, 7.7, 1.9, 5.2, 260.3, 21.1, 21.4, 10.3, and 21.3. These compartments will be modified into fuel breaks 150 feet in width. Where compartments adjoin roads or other natural or man made openings, shaded fuel breaks are recommended. In areas with no adjoining openings, standard fuel breaks are recommended. (See Appendix B for

Standards and Specifications.) It is critical that all woody surface materials and ladder fuels be cleared within this fuel break area.

Travel management – variable.

Insect and disease – No data.

Silvicultural system – variable. A combination of ground-based, helicopter, and skyline systems may be utilized.

Landings – utilize existing landings where practical. Contact manager before locating new landings.

Species composition – variable.

Average tree height – no data

Average age – no data.

Marking guides – leave tree mark. Select Douglas-fir and Engelmann spruce as leave trees when health and form class allows. Avoid retention of sub-alpine fir.

Slash disposal – most slash will be disposed of in small piles in nearby openings or within adjacent compartments. *No slash will remain within fuel breaks.*

Cutting cycle – after initial entry, fuel breaks **must** undergo periodic maintenance at least every 5 years to clear all understory woody species as well as any down and dead material.

1.1.5 Prescribed fire

Fuels reduction can be effectively accomplished with controlled burning. Due to the risks involved burn plans must be developed by qualified personnel before any controlled burning is attempted.

1.2 Non-forestland

Considerations include topographic location, slope steepness, predominant wind direction, and the amount and arrangement of surface, ladder, and crown fuels when developing fuels treatment prescriptions. Prescriptions for non-forested compartments within the project area incorporate the following components: legal access, travel management (road access), ecological site requirements, slash disposal, entry schedule, and additional information (see Appendix A – Glossary).

Non-forestland makes up a small percentage of land within the Hoback Ranches project area. The non-forestland area that does exist is primarily associated with riparian area cover types. These sites characteristically are at a low risk of fire. Riparian areas will be managed according to the silviculture standards and guidelines (Appendix B).